Atlantic Richfield Company

Atlantic Richfield Company

4 Centerpointe Drive, 4-435
La Palma, CA 90623
Direct: (714) 228-6770

November 5, 2012

Mr. Steven Way
On-Scene Coordinator
Emergency Response Program (8EPR-SA)
US EPA Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Delivered via e-mail

Subject: October 2012 Monthly Progress Report
Rico-Argentine Mine Site – Rico Tunnels
Operable Unit OU01, Rico, Colorado

Dear Mr. Way,

This progress report describes activities conducted during the month of October, 2012 at the Rico-Argentine Mine Site and activities anticipated to occur during the upcoming month. These activities are organized by task as identified in the Removal Action Work Plan. This progress report is being submitted in accordance with Paragraph 35.a of the Unilateral Administrative Order for Removal Action (the "UAO"), dated March, 2011.

ACTIVITIES FOR OCTOBER

This section describes significant developments during the preceding period including actions performed and any problems encountered during this reporting period.

Site-Wide Activities

- Russ Nelson, EPA contractor, on site October 4, 5, 16, 24, 25, 2012 and October 31, 2012.
- Jan Christner, EPA contractor, on site October 31, 2012
- Digital archives continue to be reviewed by the Atlantic Richfield project team for information that may provide a better understanding of the Rico site.
- Provided security at the Blaine, 517, and the St. Louis area.
- Cleaned equipment yard at north end of site as well as various locations throughout site.
- Started demobilization of select equipment no longer required for work onsite.

Task A – Pre-Design and Ongoing Site Monitoring

- Field data was collected at the two flumes during the October surface water sampling event.
- Surface water flow measurements were collected per protocols contained in the Sampling and Analysis Plan for Surface Water Sampling (SAP).
- Surface water samples were collected at locations and per protocols identified in the SAP.
- Surface water samples were submitted for laboratory analysis per protocols identified in the SAP.
- Four composite surface water samples were collected at Dolores River cross sections DR-1, DR-2, DR-7, and DR-4-SW per protocols identified in the SAP and in the AECOM Technical SOP for collection of cross-channel surface water samples.
- Composite samples were submitted for laboratory analysis per protocols identified in the SAP.

- Ground water samples were collected at the 12 wells completed in 2011 and eight (8) pre-existing wells located onsite.
- Ground water samples were submitted for laboratory analysis per protocols identified in the SAP.
- St. Louis tunnel water sample was collected from angle borehole BAH-01 per protocols identified in the SAP.
- St Louis tunnel water (BAH-01) sample was submitted for laboratory analysis per protocols identified in the SAP.
- Flumes were inspected for debris buildup and cleared as needed.
- A temporary culvert bridge was installed in the pond 7 discharge spillway in order to facilitate winter access on the winter sampling route.
- Downloaded available data through end of October 2012 from the Parshall flume data loggers. The data will be posted to the project data Share-point by early November.
- Downloaded available data through mid-October 2012 from the pressure transducer located in angle borehole AT-2. The data will be posted to the project Share-point by early November.
- Digital output files (electronic data deliverables) for surface water sampling analytical laboratory results from July 2012 and August 2012 have received QA/QC review and will be posted by early November to the project data Share-point site.
- Field and analytical sampling data for the July and August 2012 surface and groundwater sampling events have received QA/QC review and will be posted by early November to the project data Share-point site.
- Continued work on overall site Data Management System development.
- Conducted inspection of the pond system embankments, water levels and general conditions.

Task B – Management of Precipitation Solids in the Upper Settling Ponds

- Walkways constructed and access pathways improved at Pond 15 and Pond 18 flow control gates to provide safe access.
- Decant water from Pond 13 was returned to Pond 15 to maintain adequate pond water levels to float and supply the dredging operation.
- St Louis adit discharge water has been diverted to Pond 18; however, discharge is supplied to Pond 15 as needed to maintain adequate pond water levels to float and supply the dredging operation.
- Pond 15 solids removal completed on October 24th. Crisafulli 4-inch Severe Duty Flump remote control floating dredge was demobilized from the site on October 25th after confirmation depth surveys were completed. Portable generators, pumps, and floating pipes removed and demobilized. Aluminum pipe system from pond 15 to pond 13 was disconnected.
- Approximately 750 cubic yards of wet solids have been removed during the month from Pond 15.
- Total estimate of wet solids removed from Pond 15 is approximately 2,200 CY. Lidar scan surveys of pond 13 will be completed in early November to obtain a more accurate volume.
- Depth soundings completed to verify the remaining depth of solids in Pond 15. The average depth of the remaining wet solids is estimated at 1.95 feet.
- Decontamination areas maintained at each exit of the exclusion zone for equipment working near the ponds.
- Collected material samples and completed solids surface survey of Ponds 16/17 interim drying facility.
- Water samples collected from the discharge line into pond 13 and the return line into pond 15 and analyzed for total suspended solids. Results indicated a 99.3% reduction in solids. A second set of samples was taken after the conclusion of the dredging operations. Results will be obtained in early November.
- Calcine test pits were excavated, logged, and sampled. Samples were submitted to Hazen Labs in Golden, Colorado for the analytical parameters defined in the work plan. The following calcine samples were collected:
  - TP-CT-3, located in drying cell 3 near previous boring DH-11, was sampled at 4 ft, 15 ft, and 18 ft

  - TP-CT-4, located in drying cell 4 near groundwater well EB-2, was sampled at 8ft, 11ft, and 18 ft
- Calcine samples were submitted for SPLP analyses at Test America Laboratories.
- Began installation of drain culvert from Pond 13 to Pond 10.
- Completed design and construction of spillway above the pond 18 flow control gate.

Task C – Design and Construction of a Solids Repository

- Continued work on geotechnical analyses of an alternative drying facility and repository sites, focusing current attention on Pond 13 as an interim and potentially final drying and/or solids repository site.
- Mobilized mud rotary drill rig to supplement drilling efforts.
- 18 boreholes drilled this month; 28 total anticipated to be completed this year.
- Total borehole footage this month: 1,208 ft; total anticipated this year: 2,069 ft.
- The following drilling has been completed related to the Solids Repository Design during the month of October:
  - Alternative Drying Facility: ADF/R-102
  - Former Pond 19: P19-101,P19-102
  - South Stacked Repository: SSR-101, MW101, SSR-102,SSR-103,SSR-104
  - Pond 13: P13-101, P13-102,P13-103
  - Access Road: AR-101, AR-102,AR-103, AR-104, AR-105
- The following drilling has been completed related to the Pond Embankments during the month of October
  - Dikes and Embankments: ED-101, ED-102, ED-103, ED-104, ED-105, ED-106, ED -107, ED-108, ED-109
- Ground Penetrating Radar Profiles: Along Pond Embankments Total 3,700 linear ft.

Task D – Hydraulic Control Measures for the Collapsed Area of St. Louis Tunnel Adit

- Mobilized the drill rig for the inclined boreholes to investigate the collapsed area of the St Louis Tunnel.
- Constructed access road and drilling pad for planned borings CHI-101 and CHI-102.
- Made two attempted to drill CHI-102. Casing failed at 38 ft and again at 65 ft. Drilling will be postponed until spring of 2013.
- The following wells and geophysical work has been completed during the month of October:
  - Collapsed Adit Area: CHV-101,CHI-101, CHI-102
  - Geophysical Profiling Program – Refraction Microtremor (ReMi) Profiles; RM-201, RM-202, RM-203

Task E – Source Water Investigations and Controls

- Injection Test Summary:
  - Continued to conduct carbon dioxide monitoring at the Blaine tunnel area and the St. Louis adit to monitor possible release of carbon dioxide from the Injection Test.
  - A new calibrated pH and conductivity probe with a pressure sensor was deployed down the 517 Shaft to replace the first probe.
  - Continued injection of 23.5% solution of potassium carbonate (including lithium chloride as a continuous tracer) at an injection rate of 0.3 gallons per minute (gpm).
  - Ongoing sampling at the St Louis Tunnel discharge continues in accordance with the St. Louis Tunnel Discharge Source Mine Water Treatability Study Work Plan SAP.
  - Secondary containment system for injection test was supplemented. Additional containment consisted of pipe works leading from current spill-guard at injection tanks to a fourth empty tank and spill-guard located down-gradient from the injection tanks.

  - Water carrier system installed to pump Silver Creek water into the 517 mine shaft. Target injection rate of 25 gpm. Attempting to increase flow of mine water from the 517 to the St. Louis portal.
  - Received two more 3,800 gallon shipments of potassium carbonate.
  - Constructed 350 gallon safety shower and placed near the three poly tanks.
  - Russ Nelson (URS, on behalf of U.S. EPA) assisted with 517 and Blaine Tunnel access throughout the month to facilitate the injection test.
- The Wetland Pilot construction is complete. October construction updates:
  - Perimeter of wetland sealed with bentonite and compacted fill to prevent loss of water from underneath sheet piling.
  - Rock drain material in 1st cell of wetland was removed and replaced with cleaner drain rock. Heat trace replaced. New rock filter received inoculum.
  - Wooden walkways constructed over wetland to allow access to wetland sampling ports.
  - HDPE insulation balls placed on top layer of rock matrix in the 1st wetland cell.
  - Placed mulch and topsoil on top of wetland matrix.
  - Backfill behind sheet pile completed.
  - Plumbing to wetlands completed. Electrical systems have yet to be connected.

Task F – Water Treatment System Analysis and Design

- Ion exchange bench testing included:
  - Preparation of samples (filtration) for batch contacts - performing the first sets of batch contacts (4 sets of 3, total)
  - Selection of 4 ion exchange resin candidates for testing
  - Performed batch contacts using first three resins selected (Lewatit TP-207, Prolite S950, and Dow XUS 43604)
  - Kinetic and final aqueous samples collected for analysis
- Continued scoping of work to address data needs for water treatment system alternatives evaluation.

ACTIVITIES FOR UPCOMING MONTH

This section describes developments expected to occur during the upcoming reporting period, including a schedule of work to be performed, anticipated problems and planned resolution of past or anticipated problems.

Site-Wide Activities

- Review and post September Surface Water Sampling Report and cross sectional transect data to the project FTP site in November. (https://extranet.aecom.com/sites/ricostlouis/SitePages/Home.aspx)
- Continue development of a geologic/geotechnical model of the site utilizing RockWorks data visualization software.
- Continue reviewing the digitally archived historic documents and maps.
- Provide security, materials and equipment support to 517 injection test and wetlands construction project as needed.
- Demobilize and leave the site by Friday, November 16, 2012.
- Begin implementation of winter support and monitoring schedule.

Task A – Pre-Design and Ongoing Site Monitoring

- Conduct surface water and groundwater sampling/analyses and flow measurements per protocols contained in the SAP.

- Post surface water quality data to the FTP site after QA/QC review.
- Download data from the Parshall flume data collectors and post to the project FTP site.
- Continue work on overall site Data Management System development.
- Complete monthly inspection of St. Louis Pond system.

Task B – Management of Precipitation Solids in the Upper Settling Ponds

- Continue evaluation of calcine tailings/Pond 18 solids SPLP and associated geochemical testing.
- Continue to monitor and collected material samples and complete solids surface survey of Ponds 16/17 interim drying facility.
- Obtain an accurate quantity estimate of solids removed from Pond 15 dredging through Lidar surveys and by comparison with previous surveys completed before the start of the project.

Task C – Design and Construction of a Solids Repository

- Continue evaluation of alternative locations, including Pond 13, as possible alternative treatment solids repository and/or drying facility sites.
- Continue geotechnical analyses to support design of a permanent drying facility and repository, including initiating additional targeted site investigations and laboratory testing to address data gaps under the Supplement to FSP.
- Continue efforts to secure access to lands needed for a permanent drying facility and solids repository.
- Continue and complete drilling activities per the Supplement to Field Sampling Plan relative to Task B.

Task D – Hydraulic Control Measures for the Collapsed Area of St. Louis Tunnel Adit

- Monitor/download data from the transducer at drill hole AT-2.
- Obtain video recordings of the angle boreholes CHI-102 and BAH-01.
- Continue and complete drilling activities per the Supplement to Investigation Plan for Collapsed Adit Area at St. Louis Tunnel relevant to Task D.

Task E – Source Water Investigations and Controls

- Complete construction of the Wetlands Pilot and start the colonization period, including weekly monitoring of water quality parameters.
- Provide continuous source of 120V AC to the pilot wetland and complete all electrical systems.
- Continue implementation the St. Louis Tunnel Discharge Source Mine Water Treatability Study Work Plan (517 injection test).
- Begin injection of 25% sodium hydroxide solution into the 517 mine shaft, in addition to the continued injection of 23.5% potassium carbonate solution and Silver Creek water. Target injection of 220 gallons of 25% sodium hydroxide solution over 7 days.
- Target Date - November 7 – Complete injection of Batch No. 4 of 23.5% potassium carbonate solution, total volume of solution injected to date: 23,000 gallons (56,650 pounds potassium carbonate). Collect post-injection mine water sample from the 517 mine shaft.
- Target Date – November 7 - End all injection activities and begin decommissioning and decontamination of injection system equipment.
- November 8 – Decontamination activities and begin demobilization of equipment.
- November 14 – Collect final post-injection test mine water sample from the 517 mine shaft.
- November 15 – Complete all demobilization activities. Secure all equipment and materials for future reuse in the former Lime Treatment Building.
- Continue development of a plan to implement the source control data collection and analysis that incorporates temporary management and treatment technology testing of mine waters intercepted in the Blaine workings as part of the source control Technical Memoranda required under this Task E.

- Continue work on compilation of relevant historic mine workings and information from ongoing EPA studies into AutoCAD 3D model of the mine workings reporting to the St. Louis Tunnel.
- Continue to provide security, materials and equipment support to AMEC for 517 Injection Test and Wetland Pilot project.
- Finalize and implement a winter monitoring plan to support sampling activities at the wetland and St. Louis tunnel throughout the winter.

Task F – Water Treatment System Analysis and Design

- Implement the St. Louis Tunnel Discharge Constructed Wetland Pilot Scale Test to fully functioning capacity.
- Continue ion exchange bench scale testing.
- Continue geotechnical analyses of flood dike and pond embankment seepage/piping and stability under static and seismic loading in support of final evaluation of long-term improvements.
- Continue scoping of data needs related to treatment system alternatives.

If you have any questions, please feel free to contact me at (951) 265-4277.

Sincerely,

Anthony R. Brown
Project Manager
Atlantic Richfield Company

cc: R. Halsey, Atlantic Richfield
T. Moore, Atlantic Richfield
C. Sanchez, Anderson Engineering
D. McCarthy, Copper Environmental Consulting
T. Kreutz, AECOM
D.Yadon, AECOM
J. Decker, AECOM
J. Christner, URS Operating Services, Inc.
S. Riese, EnSci
A. Cohen, Esq., Davis Graham & Stubbs
W. Duffy, Esq., Davis Graham & Stubbs
S. D'Cruz, Esq., Atlantic Richfield
A. Piggott, Esq., U.S. EPA

file: Atlantic Richfield Rico Archives, La Palma, CA
AECOM Denver Project File